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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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10/585,000

06/29/2006

Zenta Sugawara

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3943

32294

7590

08/03/2009

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EXAMINER

KRAUSE, JUSTIN MITCHELL

ART UNIT

PAPER NUMBER

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PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No. 10/585,000	Applicant(s) SUGAWARA ET AL.	
	Examiner JUSTIN KRAUSE	Art Unit 3656	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 29 April 2006.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-8 is/are pending in the application.
- 4a) Of the above claim(s) 5-8 is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-4 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on ____ is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date <u>4/17/08, 6/29/06</u> | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Claim Objections

Claims 5-8 are objected to under 37 CFR 1.75(c) as being in improper form because a multiple dependent claim cannot depend from any other multiple dependent claim. See MPEP § 608.01(n). Accordingly, the claims 5-8 have not been further treated on the merits.

Claim Rejections - 35 USC § 112

The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

Claims 1-4 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

The scope of the claims is unclear because the claims recite "a joint structure of a robot" with the intended use of "actuating an assembly connected to a robot link", however the claim appears to include assembly and the robot link as positively recited structure. It is unclear whether the scope of the claim is "a joint structure of a robot" or the combination of a joint structure of a robot, an assembly, and a robot link.

In claim 1, the phrase, "the output shaft of the first motor and the output shaft of the second motor are in parallel with each other" is unclear. The shafts appear to be --parallel-- to one another, however, "in parallel" can be interpreted as the output

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shafts having additive power properties (both shafts drive a single output), which would make the claim unclear.

The phrases, "for causing the assembly a longitudinal swing motion" and "for causing the assembly a lateral swing motion" are unclear because the grammar is improper. The scope of the phrase cannot be determined.

In claim 2, the phrase, "for causing the assembly a rotary motion" is unclear because the meaning of the phrase cannot be determined.

There is no antecedent basis for "the central axis of the rotary motion".

Regarding claim 4, there is no antecedent basis for "the first axis of the second rotary unit".

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 1, 2 and 4 are rejected under 35 U.S.C. 103(a) as being unpatentable over Lande et al (US Patent 4,300,362) in view of Madhani et al (US Patent 5,797,900).

The directions of "a longitudinal swing motion" and "a lateral swing motion" are taken to be as described in the specification (page 1).

Lande discloses a joint structure of a robot for actuating an assembly being connected to a robot link comprising:

a first motor (13b) for causing the assembly a longitudinal swing motion with respect to the robot link (1),

a second motor (13c) for causing a lateral swing with respect to the robot link.

the first motor and second motor disposed so that the output shaft of the first motor and output shaft of the second motor are parallel to one another.

Lande does not disclose the first and second motor output shafts to be orthogonal to the robot link. Madhani teaches drive motors (M1-M5) for operating a robot joint which are arranged orthogonal to the robot link for the purpose of providing a robot joint which is dexterous, low friction, and low inertia (col. 1, line 19).

It would have been obvious to one having ordinary skill in the art at the time the invention was made to modify Lande to include drive motors arranged orthogonally to the robot link for the desired purpose of providing a dexterous, low friction and low inertia robot joint.

Further, one of ordinary skill in the art would recognize that the orientation of the motors is a matter of engineering design dependant on the particular output drive mechanism selected for use. The orientation of the motor is dependent on the selection of the gearbox or other power transmission device between the motor output shaft and the driven component. There are known power transmissions which would require the motor to be orthogonal to the robot link (for example, the cable driven system of Madhani, or a bevel gear transmission) in order for the device to function properly.

Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to modify Lande to include drive motors arranged orthogonal to the robot link, as the orientation of the motors is a matter of engineering design selection dependant on the power transfer device selected.

Regarding claim 2, Lande discloses a third motor (connected to pinion 20, not shown but described in col. 2, line 64 - col. 3, line 2), the output shaft of the third motor is shifted by a predetermined amount with respect to the central axis of rotary motion (the "predetermined amount" is the radius of pinion 20).

Regarding claim 4, Madhani discloses a first rotary unit (18a, b) connected to the assembly, and a second rotary unit (22) supporting the first rotary unit while allowing the rotation around a first axis of the first rotary unit (A), and a base (24), supporting the second rotary unit while allowing the rotation around a first axis of the second rotary unit (B), wherein the first and second motors are disposed in the base (both Lande and Madhani disclose the motors disposed in the base).

Claim 3 rejected under 35 U.S.C. 103(a) as being unpatentable over Lande in view of Madhani as applied to claims 1 and 2 above, and further in view of Iriyama (US Patent 5,732,599).

Lande discloses a moveable cover (8) being rotatable with respect to at least one of the assembly and the robot link (the moveable cover is flexible, and is free to rotate as the assembly rotates relative to the robot link).

Lande does not disclose an elastic member generating a force between the moveable cover and at least one of the assembly and the robot link, and placing the moveable cover in a predetermined position.

Iriyama teaches an elastic member (27) generating a force (sealing force) between a cover (c2) and a robot arm component for the purpose of sealing the robot joint against contaminants from the environment (col. 5, lines 25-30).

It would have been obvious to one having ordinary skill in the art at the time the invention was made to modify Lande to include an elastic member which generates a force between the moveable cover and one of the robot link and the assembly for the purpose of providing a sealing force which prevents contamination from the environment as taught by Iriyama.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to JUSTIN KRAUSE whose telephone number is (571)272-3012. The examiner can normally be reached on Monday - Friday, 8:30-5:00.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Richard Ridley can be reached on 571-272-6917. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Justin Krause/
Examiner, Art Unit 3656